WIRELESS SENSOR NETWORK SYNCHRONIZATION

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Wireless Sensor Network (WSN) is made up of many low cost nodes equipped by different sections: sensing, elaboration, clock, radio, power supply. The WSN are widely used for the distributed monitoring. When the dynamic of the system is under exam, the clock of each node is deployed for the time stamping of the acquired data. Consequently, the accuracy of the monitoring is related to the accuracy with whom the clocks are synchronized. Aim of the lesson is to give an introduction to the synchronization service for WSN. From the description of typical WSN applications the main requirements that the synchronization algorithms must satisfy will be presented. In the lesson two complementary approaches for the synchronization of WSN are presented: hierarchic and peer to peer. For both of them the state of art will be presented, highlighting their advantages and disadvantages. In the laboratory, the participants will simulate a wireless sensor network and will synchronize it.

MULTIBODY VIBRATIONS, NETWORK SYNCHRONIZATION, DYNAMICS OF RIGID BODIES, AND DOPPLER INTERFEROMETRY, ACOUSTIC POSITIONING

Grzegorz Litak

- Mechanical vibrations: from single to multibody cases
- Lagrange equations.
- Dynamics of rigid bodies
- Network synchronization: simple example - Kuramoto model
- Doppler effect
- Underwater acoustics

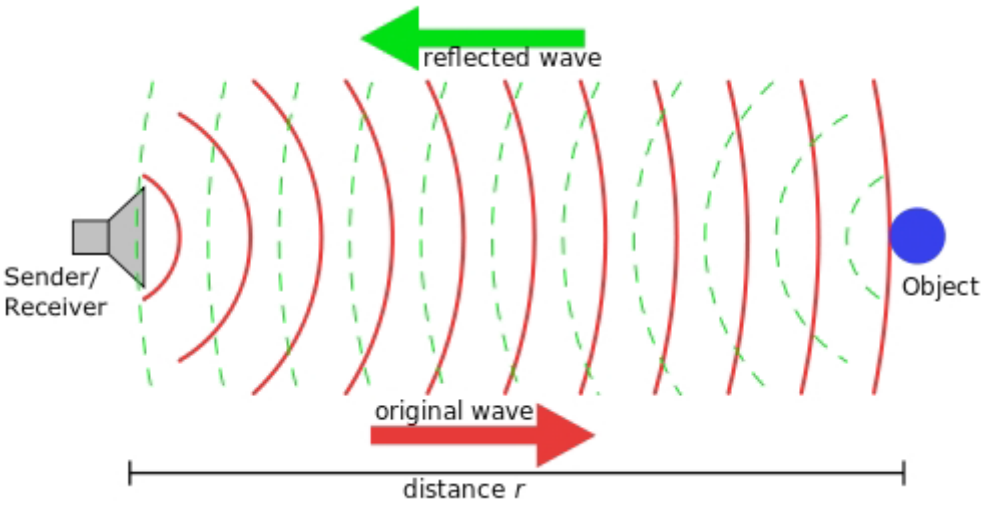

Figure 1 Active sonar creates a pulse of sound, often called a "ping", and then listens for reflections (echo) of the pulse.